# BioMap and Living Waters

## Guiding Land Conservation for Biodiversity in Massachusetts

## Core Habitats of Peru

This report and associated map provide information about important sites for biodiversity conservation in your area.

This information is intended for conservation planning, and is not intended for use in state regulations.

Produced by:

**Natural Heritage & Endangered Species Program**
**Massachusetts Division of Fisheries and Wildlife**
**Executive Office of Environmental Affairs**
**Commonwealth of Massachusetts**

Produced in 2004

# BioMap and Living Waters:
## Guiding Land Conservation for Biodiversity in Massachusetts

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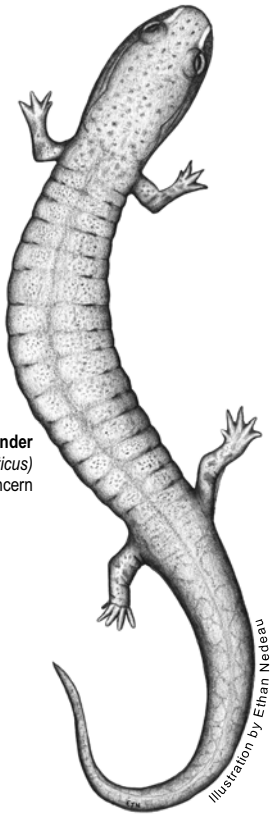
* Depending on the location of Core Habitats, your city or town may not have all of these sections.




**Spring Salamander**
*(Gyrinophilus porphyriticus)*
Species of Special Concern


*Funding for this project was made available by the Executive Office of Environmental Affairs, contributions to the Natural Heritage & Endangered Species Fund, and through the State Wildlife Grants Program of the US Fish & Wildlife Service.*



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*For more information on rare species and natural communities, please see our fact sheets online at* ***www.nhesp.org***

# BioMap and Living Waters:
## Guiding Land Conservation for Biodiversity in Massachusetts

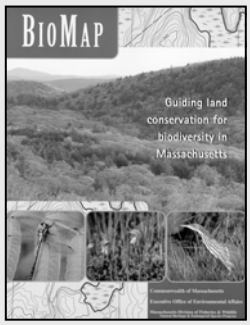
## Introduction

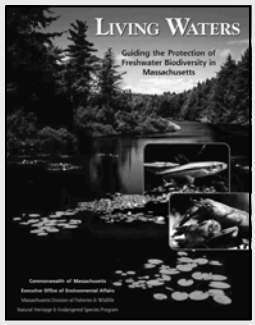
In this report, the Natural Heritage & Endangered Species Program provides you with site-specific biodiversity information for your area. Protecting our biodiversity today will help ensure the full variety of species and natural communities that comprise our native flora and fauna will persist for generatons to come.

The information in this report is the result of two statewide biodiversity conservation planning projects, ***BioMap*** and ***Living Waters***. The goal of the BioMap project, completed in 2001, was to identify and delineate the most important areas for the long-term viability of terrestrial, wetland, and estuarine elements of biodiversity in Massachusetts. The goal of the Living Waters project, completed in 2003, was to identify and delineate the rivers, streams, lakes, and ponds that are important for freshwater biodiversity in the Commonwealth. These two conservation plans are based on documented observations of rare species, natural communities, and exemplary habitats.

### What is a Core Habitat?

Both BioMap and Living Waters delineate ***Core Habitats*** that identify the most critical sites for biodiversity conservation across the state. Core Habitats represent habitat for the state's most viable rare plant and animal populations and include exemplary natural communities and aquatic habitats. Core Habitats represent a wide diversity of rare species and natural communities (see Table 1), and these areas are also thought to contain virtually all of the other described species in Massachusetts. Statewide, BioMap Core Habitats encompass 1,380,000 acres of uplands and wetlands, and Living Waters identifies 429 Core Habitats in rivers, streams, lakes, and ponds.




Get your copy of the ***BioMap*** and ***Living Waters*** reports! Contact Natural Heritage at 508-792-7270, Ext. 200 or email natural.heritage@state.ma.us. Posters and detailed technical reports are also available.

### Core Habitats and Land Conservation

One of the most effective ways to protect biodiversity for future generations is to protect Core Habitats from adverse human impacts through land conservation. For Living Waters Core Habitats, protection efforts should focus on the ***riparian areas***, the areas of land adjacent to water bodies. A naturally vegetated buffer that extends 330 feet (100 meters) from the water's edge helps to maintain cooler water temperature and to maintain the nutrients, energy, and natural flow of water needed by freshwater species.

### In Support of Core Habitats

To further ensure the protection of Core Habitats and Massachusetts' biodiversity in the long-term, the BioMap and Living Waters projects identify two additional areas that help support Core Habitats.

In BioMap, areas shown as ***Supporting Natural Landscape*** provide buffers around the Core Habitats, connectivity between Core Habitats, sufficient space for ecosystems to function, and contiguous undeveloped habitat for common species. Supporting Natural Landscape was

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generated using a Geographic Information Systems (GIS) model, and its exact boundaries are less important than the general areas that it identifies. Supporting Natural Landscape represents potential land protection priorities once Core Habitat protection has been addressed.

In Living Waters, ***Critical Supporting Watersheds*** highlight the immediate portion of the watershed that sustains, or possibly degrades, each freshwater Core Habitat. These areas were also identified using a GIS model. Critical Supporting Watersheds represent developed and undeveloped lands, and can be quite large. Critical Supporting Watersheds can be helpful in land-use planning, and while they are not shown on these maps, they can be viewed in the Living Waters report or downloaded from www.mass.gov/mgis.

## Understanding Core Habitat Species, Community, and Habitat Lists

### What's in the List?

Included in this report is a list of the species, natural communities, and/or aquatic habitats for each Core Habitat in your city or town. The lists are organized by Core Habitat number.

For the larger Core Habitats that span more than one town, the species and community lists refer to the entire Core Habitat, not just the portion that falls within your city or town. For a list of all the state-listed rare species within your city or town's boundary, whether or not they are in Core Habitat, please see the town rare species lists available at www.nhesp.org.

The list of species and communities within a Core Habitat contains only the species and natural communities that were explicitly included in a given BioMap or Living Waters Core Habitat. Other rare species or examples of other natural communities may fall within the Core Habitat, but for various reasons are not included in the list. For instance, there are a few rare species that are omitted from the list or summary because of their particular sensitivity to the threat of collection. Likewise, the content of many very small Core Habitats are not described in this report or list, often because they contain a single location of a rare plant

**Table 1.** The number of rare species and types of natural communities explicitly included in the BioMap and Living Waters conservation plans, relative to the total number of native species statewide.

**BioMap**

| | Species and Verified Natural Community Types | |
|---|---|---|
| **Biodiversity Group** | **Included in BioMap** | **Total Statewide** |
| Vascular Plants | 246 | 1,538 |
| Birds | 21 | 221 breeding species |
| Reptiles | 11 | 25 |
| Amphibians | 6 | 21 |
| Mammals | 4 | 85 |
| Moths and Butterflies | 52 | An estimated 2,500 to 3,000 |
| Damselflies and Dragonflies | 25 | An estimated 165 |
| Beetles | 10 | An estimated 2,500 to 4,000 |
| Natural Communities | 92 | > 105 community types |

**Living Waters**

| | Species | |
|---|---|---|
| **Biodiversity Group** | **Included in Living Waters** | **Total Statewide** |
| Aquatic Vascular Plants | 23 | 114 |
| Fishes | 11 | 57 |
| Mussels | 7 | 12 |
| Aquatic Invertebrates | 23 | An estimated > 2500 |

species. Some Core Habitats were created for suites of common species, such as forest birds, which are particularly threatened by habitat fragmentation. In these cases, the individual common species are not listed.

## What does 'Status' mean?

The Division of Fisheries and Wildlife determines a status category for each rare species listed under the Massachusetts Endangered Species Act, M.G.L. c.131A, and its implementing regulations, 321 CMR 10.00. Rare species are categorized as Endangered, Threatened, or of Special Concern according to the following:

- ***Endangered*** species are in danger of extinction throughout all or a significant portion of their range or are in danger of extirpation from Massachusetts.
- ***Threatened*** species are likely to become Endangered in Massachusetts in the foreseeable future throughout all or a significant portion of their range.
- ***Special Concern*** species have suffered a decline that could threaten the species if allowed to continue unchecked or occur in such small numbers or with such restricted distribution or specialized habitat requirements that they could easily become Threatened in Massachusetts.

In addition, the Natural Heritage & Endangered Species Program maintains an unofficial ***watch list*** of plants that are tracked due to potential conservation interest or concern, but are not regulated under the Massachusetts Endangered Species Act or other laws or regulations. Likewise, described natural communities are not regulated any laws or regulations, but they can help to identify ecologically important areas that are worthy of protection. The status of natural communities reflects the documented number and acreages of each community type in the state:

- ***Critically Imperiled*** communities typically have 5 or fewer documented sites or have very few remaining acres in the state.
- ***Imperiled*** communities typically have 6-20 sites or few remaining acres in the state.
- ***Vulnerable*** communities typically have 21-100 sites or limited acreage across the state.
- ***Secure*** communities typically have over 100 sites or abundant acreage across the state; however excellent examples are identified as Core Habitat to ensure continued protection.

**Legal Protection of Biodiversity**

BioMap and Living Waters present a powerful vision of what Massachusetts would look like with full protection of the land that supports most of our biodiversity. To create this vision, some populations of state-listed rare species were deemed more likely to survive over the long-term than others.

Regardless of their potential viability, all sites of state-listed species have full legal protection under the Massachusetts Endangered Species Act (M.G.L. c.131A) and its implementing regulations (321 CMR 10.00). Habitat of state-listed wildlife is also protected under the Wetlands Protection Act Regulations (310 CMR 10.37 and 10.59). The ***Massachusetts Natural Heritage Atlas*** shows **Priority Habitats**, which are used for regulation under the Massachusetts Endangered Species Act and Massachusetts Environmental Policy Act (M.G.L. c.30) and **Estimated Habitats**, which are used for regulation of rare wildlife habitat under the Wetlands Protection Act. For more information on rare species regulations, see the *Massachusetts Natural Heritage Atlas*, available from the Natural Heritage & Endangered Species Program in book and CD formats.

BioMap and Living Waters are conservation planning tools and do not, in any way, supplant the Estimated and Priority Habitat Maps which have regulatory significance. Unless and until the combined BioMap and Living Waters vision is fully realized, we must continue to protect all populations of our state-listed species and their habitats through environmental regulation.

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## Understanding Core Habitat Summaries

Following the BioMap and Living Waters Core Habitat species and community lists, there is a descriptive summary of each Core Habitat that occurs in your city or town. This summary highlights some of the outstanding characteristics of each Core Habitat, and will help you learn more about your city or town's biodiversity. You can find out more information about many of these species and natural communities by looking at specific ***fact sheets*** at www.nhesp.org.

## Next Steps

BioMap and Living Waters were created in part to help cities and towns prioritize their land protection efforts. While there are many reasons to conserve land – drinking water protection, recreation, agriculture, aesthetics, and others – BioMap and Living Waters Core Habitats are especially helpful to municipalities seeking to protect the rare species, natural communities, and overall biodiversity within their boundaries. Please use this report and map along with the rare species and community fact sheets to appreciate and understand the biological treasures in your city or town.

### Protecting Larger Core Habitats

Core Habitats vary considerably in size. For example, the average BioMap Core Habitat is 800 acres, but Core Habitats can range from less than 10 acres to greater than 100,000 acres. These larger areas reflect the amount of land needed by some animal species for breeding, feeding, nesting, overwintering, and long-term survival. Protecting areas of this size can be very challenging, and requires developing partnerships with neighboring towns.

Prioritizing the protection of certain areas within larger Core Habitats can be accomplished through further consultation with Natural Heritage Program biologists, and through additional field research to identify the most important areas of the Core Habitat.

### Additional Information

If you have any questions about this report, or if you need help protecting land for biodiversity in your community, the Natural Heritage & Endangered Species Program staff looks forward to working with you.

Contact the Natural Heritage & Endangered Species Program:

*by Phone* *508-792-7270, Ext. 200*

*by Fax:* *508-792-7821*

*by Email:* *natural.heritage@state.ma.us*.

*by Mail:* *North Drive*
*Westborough, MA 01581*

The GIS datalayers of BioMap and Living Waters Core Habitats are available for download from MassGIS: www.mass.gov/mgis

Check out www.nhesp.org for information on:

- Rare species in your town
- Rare species fact sheets
- BioMap and Living Waters projects
- Natural Heritage publications, including:
  - Field guides
  - Natural Heritage Atlas, and more!



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# BioMap: Species and Natural Communities

## Peru

### Core Habitat BM612

#### Natural Communities

| Common Name | Scientific Name | Status |
|---|---|---|
| Forest Seep Community | | Secure |

#### Plants

| Common Name | Scientific Name | Status |
|---|---|---|
| Barren Strawberry | *Waldsteinia fragarioides* | Special Concern |
| Dwarf Scouring-Rush | *Equisetum scirpoides* | Special Concern |

#### Invertebrates

| Common Name | Scientific Name | Status |
|---|---|---|
| Riffle Snaketail | *Ophiogomphus carolus* | Threatened |
| Ski-Tailed Emerald | *Somatochlora elongata* | Special Concern |

### Core Habitat BM633

#### Plants

| Common Name | Scientific Name | Status |
|---|---|---|
| Small Site for Rare Plant | | |

### Core Habitat BM634

#### Plants

| Common Name | Scientific Name | Status |
|---|---|---|
| Small Site for Rare Plant | | |

### Core Habitat BM656

#### Invertebrates

| Common Name | Scientific Name | Status |
|---|---|---|
| Ocellated Darner | *Boyeria grafiana* | Special Concern |

# BioMap: Species and Natural Communities

## Peru

### Core Habitat BM660

#### Natural Communities

| Common Name | Scientific Name | Status |
|---|---|---|
| Spruce-Fir Boreal Swamp | | Vulnerable |

#### Plants

| Common Name | Scientific Name | Status |
|---|---|---|
| Dwarf Mistletoe | *Arceuthobium pusillum* | Special Concern |

### Core Habitat BM662

#### Vertebrates

| Common Name | Scientific Name | Status |
|---|---|---|
| American Bittern | *Botaurus lentiginosus* | Endangered |

### Core Habitat BM680

#### Plants

| Common Name | Scientific Name | Status |
|---|---|---|
| Small Site for Rare Plant | | |

### Core Habitat BM681

#### Natural Communities

| Common Name | Scientific Name | Status |
|---|---|---|
| Black Ash-Red Maple-Tamarack Calcareous Seepage Swamp | | Imperiled |

#### Plants

| Common Name | Scientific Name | Status |
|---|---|---|
| Hemlock Parsley | *Conioselinum chinense* | Special Concern |
| Sensitive Rare Plant | | |

Vertebrates

| Common Name | Scientific Name | Status |
|---|---|---|
| Wood Turtle | *Clemmys insculpta* | Special Concern |

**Core Habitat BM686**

Plants

| Common Name | Scientific Name | Status |
|---|---|---|
| Small Site for Rare Plant | | |

**Core Habitat BM691**

Plants

| Common Name | Scientific Name | Status |
|---|---|---|
| Small Site for Rare Plant | | |

# BioMap: Core Habitat Summaries

## Peru

### Core Habitat BM612

The streams and upland forests within this Core Habitat support rare dragonfly species, including the Riffle Snaketail and the Ski-tailed Emerald. The Core Habitat supports a diversity of plant species, some of which are found within a Forest Seep community. In another part of the Core Habitat, there is a large population of the rare Barren Strawberry. While some of the upland habitat is within the Bryant Mountain State Forest, the majority of this Core Habitat appears to be unprotected.

#### Natural Communities

This Core Habitat contains a narrow and long seepy hillside that supports a diverse assemblage of plant species in a Forest Seep community. Forest Seeps are hardwood forests found on wet slopes, where groundwater seeps out of the earth. The overstory is similar to that of the surrounding forest, but many typical wetland ferns, shrubs, and other plants occur as well.

#### Plants

A very large, vigorous occurrence of the Dwarf Scouring-Rush, a diminutive relative of the ferns, grows in cool forest habitat within this Core Habitat. Also within this area is the largest known population in the state of Barren Strawberry, a plant Species of Special Concern.

#### Invertebrates

This Core Habitat includes streams such as Alder Meadow Brook, Wolf Brook, and Westfield Brook, as well as adjacent forested, unfragmented uplands that are habitat for rare species of dragonflies including the Riffle Snaketail and the Ski-tailed Emerald. This Core Habitat is within dispersal distance of Core Habitat in Cummington, which allows for movement of Riffle Snaketails and other dragonflies between these areas. Pollution and hydrologic alterations originating upstream, downstream, or within this Core Habitat are major threats to the rare species inhabiting the area.

### Core Habitat BM656

#### Invertebrates

This Core Habitat includes a 3-km stretch of Trout Brook in Worthington and Peru that is habitat for the rare Ocellated Darner dragonfly. The surrounding landscape is both forested and unfragmented, which protects the river from pollution. This Core Habitat is located less than 10 km from other habitat for the Ocellated Darner within Core Habitats in Cummington and Chesterfield, which probably allows for the dispersal of individual dragonflies between these three areas. While the northwestern half of this Core Habitat is within the Peru Wildlife Management Area, the remaining half appears to be unprotected.

# BioMap: Core Habitat Summaries

## Peru

### Core Habitat BM660

#### Natural Communities

This Core Habitat contains a Spruce-Fir Boreal Swamp of good quality. Spruce-Fir Boreal Swamps are forested wetlands dominated by Red Spruce and Balsam Fir. These swamps are typically found at stream headwaters or in poorly drained basins in the mountainous, northwestern part of the state. Here the large headwater swamp is also associated with a rare plant species.

#### Plants

Within this spruce-fir boreal swamp, the hemi-parasitic Dwarf Mistletoe thrives on the boughs of Black Spruce.

### Core Habitat BM662

#### Vertebrates

This Core Habitat encompasses a small pond and series of sedge meadows and shrub swamps at the headwaters of Fuller Brook in Peru. These beaver-maintained and modified wetlands provide habitat for American Bitterns and other wetland birds. A portion of this Core Habitat is protected within the Peru Wildlife Management Area.

### Core Habitat BM681

This Core Habitat, encompassing riparian areas, upland forests, and scattered small fields along the East Branch of the Housatonic River and several of its tributaries, provides significant habitat for Wood Turtles. It also contains a calcareous seepage swamp that provides habitats for rare plants such as Hemlock Parsley. Over half the Core Habitat is protected as conservation land within the Hinsdale Flats Wildlife Management Area, and further protection of key habitats is needed.

#### Natural Communities

This Core Habitat contains a large example of a good-quality Black Ash-Red Maple-Tamarack Calcareous Seepage Swamp that is associated with several state-listed plant species. Black Ash-Red Maple-Tamarack Calcareous Seepage Swamps are mixed deciduous-coniferous forested swamps occurring in areas where there is calcium-rich groundwater seepage. This nutrient enrichment results in many rare calcium-loving plant species. This is an unusual community type found primarily in western Massachusetts.

#### Plants

A large population of Hemlock Parsley (Species of Special Concern) is growing here in an alkaline seepage swamp.

## Vertebrates

The riparian habitats within this Core Habitat, including meandering streams and brooks bordered by wet meadows, shallow marshes, forested and shrub wetlands, as well as the upland forests and fields provide significant habitat for Wood Turtles. Although over half the Core Habitat is protected as conservation land within the Hinsdale Flats Wildlife Management Area, substantial and important areas of habitat within it remain unprotected.




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# Living Waters: Species and Habitats

## Peru

### Core Habitat LW355

#### Exemplary Habitats

| Common Name | Scientific Name | Status |
|---|---|---|
| Fish Habitat | | ---------- |
| Invertebrate Habitat | | ---------- |

#### Fishes

| Common Name | Scientific Name | Status |
|---|---|---|
| Bridle Shiner | *Notropis bifrenatus* | Special Concern |
| Lake Chub | *Couesius plumbeus* | Endangered |
| Longnose Sucker | *Catostomus catostomus* | Special Concern |

### Core Habitat LW429

#### Exemplary Habitats

| Common Name | Scientific Name | Status |
|---|---|---|
| Invertebrate Habitat | | ---------- |

#### Invertebrates

| Common Name | Scientific Name | Status |
|---|---|---|
| Creeper | *Strophitus undulatus* | Special Concern |

# Living Waters: Core Habitat Summaries

## Peru

### Core Habitat LW355

This Core Habitat stretches more than 30 miles, encompassing the East Branch of the Westfield River and many of its tributaries from Huntington to Savoy. These freshwater habitats are among the best in the state for fishes and aquatic insects.

The fish communities here are indicative of cold, clean, rocky habitats with flowing waters. For example, a section of the Westfield River in Chesterfield supports a community of Blacknose Dace, Common Shiner, Longnose Dace, Slimy Sculpin, White Sucker, and Lake Chub. These fishes require clean cobble and gravel substrates for spawning and are dependent on fast flowing waters. In a section of Westfield Brook in Cummington, the fish community reflects a relatively small, cold, moderately flowing stream with clean rocky substrates. The fish community it supports is diverse; it consists of Blacknose Dace, Creek Chub, Common Shiner, Brook Trout, Longnose Dace, Slimy Sculpin, White Sucker, Lake Chub, and Bridle Shiner.

The state-Endangered Lake Chub can be found along this Core Habitat, which is one of only two sites in the state that supports this species. This fish requires moderate- to fast-flowing, clear, cold streams with gravel and rubble substrates. In the spring, this species may move large distances to spawn (breed). Excess sediments can degrade the clean gravel needed for spawning and proper egg development. Increases in sediments cloud the water and impair this species' visual feeding.

Another rare fish, the Longnose Sucker, is found in the East Branch of the Westfield River and its tributaries in the Cummington-Windsor area. This fish Species of Special Concern is restricted to the western watersheds of Massachusetts, where it is found in cold, clean, oxygen-rich streams with gravel bottoms. The Longnose Sucker may also migrate many miles to reach its spawning grounds. The eggs are released over the gravel bottom, making them susceptible to excess sedimentation, flow alterations, and increases in water temperature. These habitat degradations can be particularly detrimental to the reproductive success of this slow-growing fish that does not reach maturity until 5 to 7 years of age.

A third rare fish species, the Bridle Shiner, is found in a section of Westfield Brook in Cummington. This is the only known population of Bridle Shiner in the Westfield Watershed. This fish Species of Special Concern has a small range from southern New England to South Carolina, and has been declining or extirpated in much of the region. The Bridle Shiner is typically found in well-vegetated, quiet waters. It feeds on small aquatic insects and other invertebrates, and is an important part of the freshwater ecosystem as prey for larger fishes.

This Core Habitat also provides excellent habitat for aquatic invertebrates. The area includes habitat for several species of state-listed dragonflies and damselflies, from the mainstem of the river up to the small, acidic headwater streams. The Little River also supports a healthy community of the more ecologically sensitive aquatic insects: mayflies, stoneflies, and caddisflies. The naturally vegetated streambanks help maintain the habitat quality, shading the water to keep it cool and controlling the runoff of sediments, excess nutrients, and water. Sections of this Core Habitat are already protected, but protecting the remaining riparian areas along the Westfield River and its tributaries will aid in maintaining the integrity of these excellent freshwater habitats.

# Living Waters: Core Habitat Summaries

## Peru

### Core Habitat LW429

The Middle Branch of the Westfield River, along with its tributaries, provide key habitat for aquatic insects and freshwater mussels. This Core Habitat includes habitat for several species of state-listed dragonflies and damselflies, from the river's mainstem up to the small, acidic, headwater streams. These aquatic insects are good indicators of ecosystem health, suggesting that this Core Habitat contains high-quality freshwater habitats for other underwater species as well.

For example, Kinne Brook, supports the more ecologically sensitive aquatic insects: mayflies, stoneflies, and caddisflies. This brook originates in Worthington, flows south into Chester through agricultural lands and forests, and joins the Middle Branch of the Westfield River. The forested stream banks help maintain the high-quality habitat by shading the water to keep it cool, by providing a natural energy source to the stream ecosystem in the form of leaves, needles, and sticks, and by controlling the runoff of sediments, excess nutrients, and water.

The short stretch of the Middle Branch of the Westfield River below the Littleville Dam supports a population of the freshwater mussel, known as the Creeper mussel. This species is found in the pockets of sand and gravel that collect between the more typical cobble and boulders found along the river bottom.

Protecting the remaining unprotected riparian areas along the Westfield River, as well as the land surrounding its tributaries will aid in maintaining the integrity of these excellent freshwater habitats.

# Help Save Endangered Wildlife!

Please contribute on your Massachusetts income tax form or directly to the

Natural Heritage &
Endangered Species Fund

To learn more about the Natural Heritage & Endangered Species Program and the Commonwealth's rare species, visit our web site at: www.nhesp.org.